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Kenyon & Kenyon Attorney Docket No. 10396/46201
(Fenster & Co. Docket No. 082/01675)

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A method of determining an acoustic velocity in a segment of a bone covered with a layer of soft tissue having an outer surface, comprising:

determining a first travel time of a first ultrasonic wave along a first path from said outer surface back to said outer surface which path includes a first bone path in at least a first part of said bone segment and a first soft tissue path in at least part of said soft tissue;

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determining a second travel time of a second ultrasonic wave along a second path from said outer surface back to said outer surface which path includes a second bone path in at least a second part of bone segment and a second soft tissue path in at least part of said soft tissue;

determining a third travel time of a third ultrasonic wave along a third path from said outer surface back to said outer surface which path includes a third bone path in at least a third part of said bone segment and a third soft tissue path in at least part of said soft tissue; and

defining relationships between the acoustic velocity in bone and the travel times by a set of simultaneous equations, and deriving ~~said~~ a value for the acoustic velocity in ~~said segment of~~ bone ~~from said three determined travel times;~~ based on a solution of the set of simultaneous equations

~~wherein said paths each start at a start point and end at an end point and wherein said start and end points are not collinear~~.

2. (Previously Presented) A method according to claim 1, wherein at least two of said first, second and third waves are generated simultaneously by a single transmitter.

3. (Previously Presented) A method according to claim 1, wherein at least two of said first, second and third waves are detected simultaneously by a single transmitter.

4. (Previously Presented) A method according to claim 1, wherein at least two of said first, second and third waves each have an average frequency that is substantially the same, when generated.

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5. (Previously Presented) A method according to claim 1, wherein at least two of said first, second and third waves each have an average frequency that is substantially different, when generated.

6. (Previously Presented) A method according to claim 1, wherein at least two of said first, second and third waves each have an average frequency that is substantially different, when detected.

7. (Previously Presented) A method according to claim 1, wherein at least two of said first, second and third waves each have an average frequency that is substantially the same, when detected.

8. (Currently Amended) A method according to claim 1, wherein ~~each of said first, second and third paths comprises soft tissue portions and wherein~~ at least two of said first, second and third soft tissue paths have an overlap of at least 20%~~ over the length of their soft tissue portions~~.

9. (Currently Amended) A method according to claim 1, wherein ~~each of said first, second and third paths comprises soft tissue portions and wherein~~ at least two of said first, second and third soft tissue paths have an overlap of at least 30%~~ over the length of their soft tissue portions~~.

10. (Currently Amended) A method according to claim 1, wherein ~~each of said first, second and third paths comprises soft tissue portions and wherein~~ no two of said first, second and third soft tissue paths overlap by more than 20%~~ over the length of their soft tissue portions~~.

11. (Currently Amended) A method according to claim 1, wherein ~~each of said first, second and third paths comprises soft tissue portions and wherein~~ no two of said first, second and third soft tissue paths overlap by more than 30%~~ over the length of their soft tissue portions~~.

12. (Currently Amended) A method according to claim 1, wherein at least two of said first, second and third bone ~~parts~~ paths overlap at least 20% over their length.

13. Currently Amended) A method according to claim 1, wherein at least two of said first, second and third bone ~~parts~~ paths overlap at least 40% over their length.

14. (Currently Amended) A method according to claim 1, wherein at least two of said first, second and third bone ~~parts~~ paths overlap at least 70% over their length.

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15. (Currently Amended) A method according to claim 1, wherein no two of said first, second and third bone ~~parts~~ paths overlap by 20% or more of their length.

16. (Currently Amended) A method according to claim 1, wherein no two of said first, second and third bone ~~parts~~ paths overlap by 40% or more of their length.

17. (Currently Amended) A method according to claim 1, wherein no two of said first, second and third bone ~~parts~~ paths overlap by 70% or more of their length.

18. (Previously Presented) A method according to claim 1, comprising estimating a soft tissue velocity and wherein deriving said acoustic velocity comprises deriving said bone velocity using said estimated soft tissue velocity.

19. (Currently Amended) A method according to claim 1, comprising determining a fourth travel time of a fourth ultrasonic wave along a fourth path from said outer surface back to said outer surface which path includes at least a fourth part of said bone segment and wherein the set of equations comprises at least one equation defining a relationship between the

acoustic velocity in bone and the fourth travel time ~~deriving said acoustic velocity comprises deriving a bone velocity also using the fourth travel time~~.

20. (Previously Presented) A method according to claim 1, wherein geometric projections of at least tow of said acoustic wave paths onto the outer surface are parallel.

21. (Previously Presented) A method according to claim 1, wherein no geometric projections of said acoustic wave paths onto the outer surface are parallel to each other.

22. (Previously Presented) A method according to claim 1, wherein said acoustic waves are generated and detected by ultrasonic elements at end faces thereof and wherein said end faces are not coplanar.

23. (Previously Presented) A method according to claim 1, wherein said outer surface is not parallel to an outer surface of said bone, while said waves travel through said bone.

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24. (Previously Presented) A method according to claim 1, wherein deriving comprises solving a set of simultaneous equations.

25. (Previously Presented) A method according to claim 1, comprising, repeating said determining of travel times and said deriving of acoustic velocity for a plurality of bone segments, to generate a map of acoustic bone velocity of at least a portion of a bone.

26. (Previously Presented) A method according to claim 1, comprising, repeating said determining of travel times and said deriving of acoustic velocity for a plurality of orientations of travel of said waves through said bone, to generate a map of directional acoustic bone velocity of at least a portion of a bone.

27. (Currently Amended) A method of determining at least one of a set of unknowns, including an acoustic bone velocity, acoustic soft tissue velocity, a thickness of said soft

tissue and an inclination angle of an outer surface of said soft tissue relative to the bone, comprising:

determining the travel time of at least three ultrasonic waves which travel from said surface, to said bone, along ~~the surface of~~ a region in said bone and back to said surface;

assuming a value for at least one of said unknowns; ~~and~~

defining relationships between the remaining unknowns by a set of simultaneous equations that are dependent on the travel times and the assumed value; and

deriving, by solving ~~a~~ the set of simultaneous equations, at least one of said unknowns from said three determined travel times and from said assumed value.

28. (Currently Amended) A method according to claim 27, wherein said assumed unknown comprises an acoustic soft tissue velocity.

29. (Currently Amended) A probe for acoustic bone velocity measurement, comprising:

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at least four ultrasonic elements, at least one of which comprises a transmitter and at least one of which comprises a receiver~~, wherein said ultrasonic elements are not all collinear~~; and

a controller which controls said at least one transmitter to transmit at least three ultrasonic waves through a layer of soft tissue to a bone, which controller detects via said at least one receiver, at least relative travel times of said at least three waves, after they travel along a surface of in said bone and which controller derives an acoustic bone velocity ~~from said determined at least travel times~~ based on a solution of a set of simultaneous equations that define relationships between the acoustic velocity in the bone and the relative travel times.

30. (Previously Presented) A probe according to claim 29, wherein said at least four ultrasonic elements comprise three transmitters and one receiver.

31. (Previously Presented) A probe according to claim 29, wherein said at least four ultrasonic elements comprise three receivers and one transmitter.

32. (Previously Presented) A probe according to claim 29, wherein said at least four ultrasonic elements comprise two receivers and two transmitters.

33. (Previously Presented) A probe according to claim 29, wherein all of said ultrasonic elements are coplanar.

34. (Previously Presented) A probe according to claim 29, wherein not all of said ultrasonic elements are coplanar.

35. (Currently Amended) A probe according to claim 29, wherein said probe comprises a surface a surface adapted to be urged against a skin layer of a soft tissue and wherein said ultrasonic elements are inclined relative to said surface of said probe at an inclination angle.

36. (Previously Presented) A probe according to claim 35, wherein said inclination angle is determined responsive to an expected acoustic bone velocity.

37. (Previously Presented) A probe according to claim 29, wherein said at least three ultrasonic waves are generated by a single transmitter as a single wave, which wave scatters to form said at least three waves.

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38 to 83. (Canceled).